Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

"Hybridization between Nano Cavities for Polarimetric Color Sorter at the Sub-Micron Scale"

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Supporting information including:

4 pages with 4 figures and 1 table

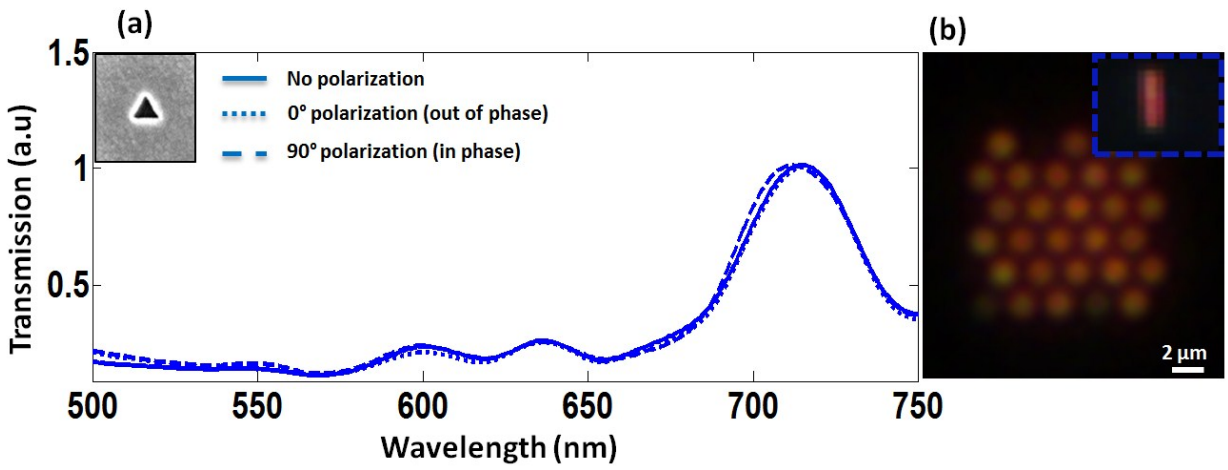

Figure S1. (a) Optical transmission spectra of a single triangle, extracted from an array of uncoupled triangles. This triangle is the same typical one, with a 200 nm equilateral side-length, milled on a glass substrate covered by a 180 nm thick Ag opaque layer, and overlaid by a 100 nm PVA layer. The graph consists of three spectra acquired with unpolarized, 0° linearly polarized and 90° linearly polarized incident light. The left inset is a high resolution scanning electron microscope (HR-SEM) image of the triangular nano-cavity. (b) Transmission image of an array of uncoupled triangles, note the typical red-orange color. The upper-right inset is a transmission image of a pentamer made of uncoupled triangles; its triangular sub-units lie 1 µm apart. The red-orange hue is similar in both cases.

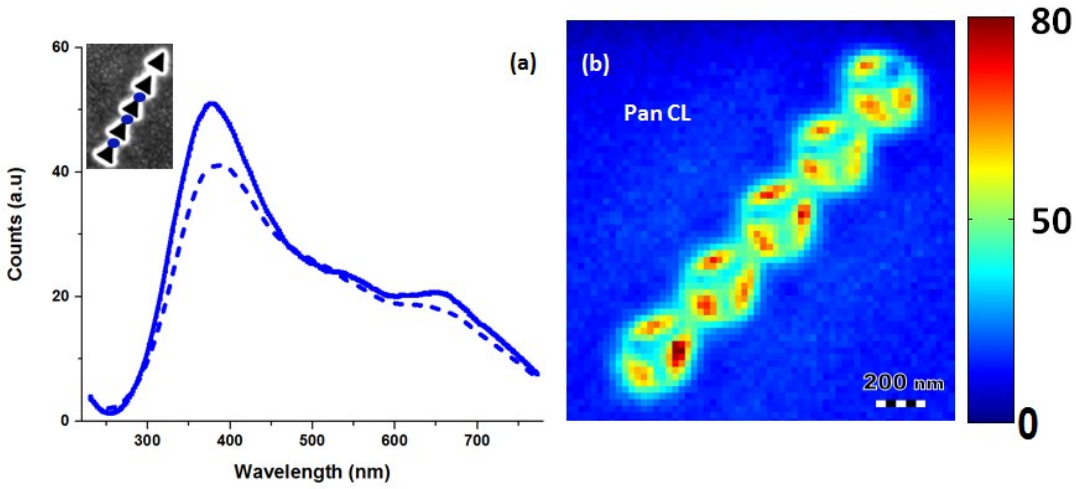

Figure S2. (a) Spectra of the "communication" mode region (continuous blue curve), and the superposition combination of the same region (dashed blue curve) for the 400nm pentamer. The superposition curve is a linear combination of 3 local modes in proximity, which are: the facet, the side-length, and the intra-cavital regions (as fragmented in Figure 3). The upper-left SEM inset illustrates the region where the data were extracted (3 blue dots). (b) Panchromatic CL image of the 400 nm pentamer, showing the "communication" mode which is delocalized over the whole pentameric unit. The strong signal arises in-between the nano-cavities.

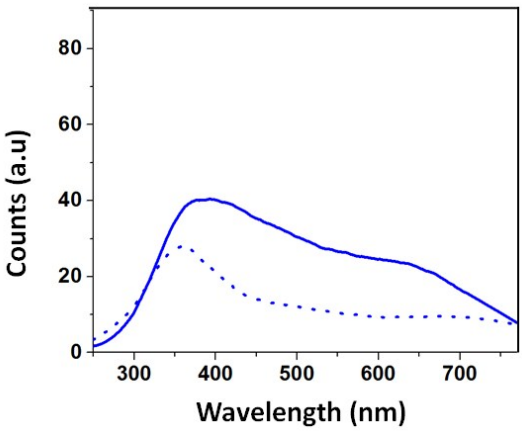

Figure S3. CL spectra obtained from points 1 (solid curve) and 2 (dashed curve) of figure 5a (400 nm pentamer).

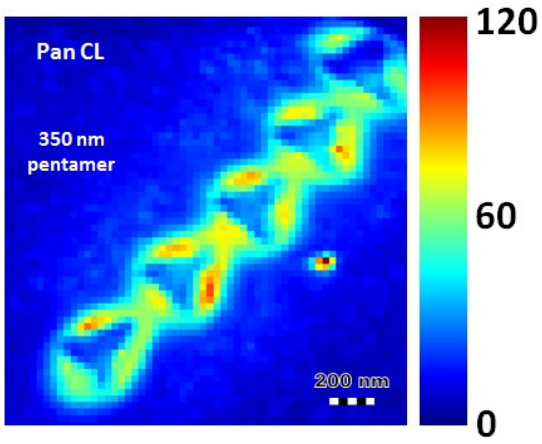

Figure S4. A broad band CL image (390-490 nm) of the 350 nm pentamer without PVA, showing the intense side-length modes and tip modes which undergo hybridization. We postulate that these modes greatly contribute to the enhancement in transmission spectra at the region at about 580-680 nm (Fig. 1b in the manuscript).

Table S1. A summarized assignment of the single triangular modes obtained both by CL, and linear optical transmission. We wrote in parentheses the expected peak positions if the structures were coated with PVA as in the transmission optical measurements.

Plasmonic modes	**Obtained CL modes (no PVA)**	**Obtained transmission modes (PVA coated)**
WGM (intra-cavity)	480 nm (720 silver/air) 650 nm (975 silver/glass)	720 nm
Tip	410 nm (615 nm)	635 nm
Side-length	394 nm (591 nm)	600 nm
Facet	369 nm (550 nm)	546 nm